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10.3 Key

HW p 544

13-33 odd

$$\log_5 2 \approx .4307 \quad \log_5 3 \approx .6826$$

$$13. \log_5 9$$

$$\log_5 3^2 = 2 \log_5 3 = 2(.6826) \\ \approx 1.3652$$

$$15. \log_5 \frac{2}{3}$$

$$\log_5 2 - \log_5 3$$

$$.4307 - .6826 \approx -0.2519$$

$$17. \log_5 50 = \log_5 5^2 + \log_5 2$$

$$2 + .4307$$

$$\approx 2.4307$$

$$19. \log_5 \frac{1}{2} = \log_5 2^{-1} = -1 \log_5 2 \\ = -.4307$$

$$21. \log_3 5 + \log_3 x = \log_3 10$$

$$\log_3 5x = \log_3 10$$

$$5x = 10$$

$$x = 2$$

$$23. \log_{10} 16 - \log_{10} 2t = \log_{10} 2$$

$$\log_{10} \frac{16}{2t} = \log_{10} 2$$

$$\frac{16}{2t} = 2$$

$$4 = t$$

$$25. \log_2 n = \frac{1}{4} \log_2 16 + \frac{1}{2} \log_2 49$$

$$= \log_2 16^{\frac{1}{4}} + \log_2 49^{\frac{1}{2}}$$

$$\log_2 14$$

$$\textcircled{n = 14}$$

$$27. \log_{10} z + \log_{10} (z+3) = 1$$

$$\log_{10} z(z+3) = 1$$

$$10 = z^2 + 3z$$

$$0 = z^2 + 3z - 10$$

$$(z+5)(z-2)$$

$$z = -5 \quad \textcircled{z = 2}$$

$$29. \log_2 (12b-21) - \log_2 (b^2-3) = 2$$

$$\log_2 \frac{12b-21}{b^2-3} = 2$$

$$2^2 = \frac{12b-21}{b^2-3}$$

$$4b^2 - 12 = 12b - 21$$

$$4b^2 - 12b + 9 = 0$$

$$(2b-3)^2 = 0$$

$$b = \frac{3}{2}$$

\emptyset

$$31. \log_3 .1 + 2 \log_3 x = \log_3 2 + \log_3 5$$

$$\log_3 .1 x^2 = \log_3 10$$

$$\frac{1}{10} x^2 = 10$$

$$x^2 = 100$$

$$x = \pm 10$$

$$\textcircled{10}$$

$$33. \log_a 4n - 2 \log_a x = \log_a x$$

$$\frac{4n}{x^2} = x$$

$$4n = x^3$$

$$\textcircled{n = \frac{x^3}{4}}$$

